NAEB

TV Engineering Newsletter

NATIONAL ASSOCIATION OF EDUCATIONAL BROADCASTERS

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NAEB ENGINEERING NEWSLETTER No. 3
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Here is Issue No. 3 of the NAEB Engineering Newsletter. It seems like quarterly publication fits into our schedule best. So unless we are smothered with contributions, we'll try to maintain that schedule.

From the Table of Contents above you will notice that we have added material besides the Technical Tips columns of the regular monthly Newsletter which goes to all NAEB members. We had the promise of another article, but somehow it didn't materialize so we'll include it next time. In the meantime, why don't you turn author and send us some material for our next issue which will be published three months from now.

Enclosed with this Newsletter is Supplement No. 1 to the Technical Directory. We have mimeographed it on one side of the page so that if you wish you may clip the additions and put them in their proper place in your directory. We solicit your help in keeping our directory up to date. The post office doesn't forward material sent at book rate, so unless you have asked that it be forwarded and agree to pay postage, it is returned to us. So please let us know when you change your address.

Cecil S Bidlack

Cecil S. Bidlack
August 23, 1955

TV TECHNICAL TIPS NO. 9
June, 1955
By Cecil S. Bidlack, NAEB TV Engineer

It's hard to believe that another month has rolled around and time for another Newsletter. Seems like we always write this column under pressure. Wonder why the 25th of the month always finds us away from the office so that Jan is starting the stencils before we even begin this.

Looking back over the month several things of note seem newsworthy. First, work on the Technical Directory was completed and the stencils sent to be mimeographed. Then copy for the second issue of the Engineering Newsletter was assembled, stenciled, reproduced and both placed in the mail. The Technical Directory went to all active members, associate members, and those listed within, while the Engineering Newsletter went only to this Technical Directory list.

So far only a couple of bricks have come our way because we failed to list stations and staff; we dodged by stating that they had failed to return the Technical Directory cards. We thought we made things easy by addressing and even stamping them for return. We knew we didn't have everyone and thought possibly they weren't interested so we'll try again - but don't wait for our letter. If your station and technical crew aren't listed we'd be more than glad to include them on a correction sheet in the near future.

Then, at long last, page proofs for the report of the first NAEB TV Engineering Workshop went to the printer. We hope to have this in the mail soon.

The NAEB Engineering Committee met in Washington, D. C. the evening of May 22 and also on May 23rd and 24th. Five members of the Committee were on hand for the meeting. Those present in addition to Chairman Menzer of WSUI, were Brugger - WILL-AM-FM-TV, Holmberg - KUOM, Ketcham - WOI-AM-FM-TV, and Kratt - WNYE. Bob Higgy of WOSU-AM-FM-TV was temporarily ill and unable to make the trip. Cy Braum of JCET and Cecil Bidlack NAEB TV Engineer were also present. Chairman Menzer had a very compresensive agenda prepared, which the committee covered item by item.

A great deal of time was spent in discussing the detailed program of the 1955 Engineering Workshop. In the next Newsletter we hope to list complete details of the program. Technical aspects of the NAEB Network were discussed at considerable length and some exploratory work is being done on the cost of an experimental live network with transmission from station to station on a "round robin" basis by FM, AM, wire or FM multiplex. A method of quality control for the tape network was also considered. When the committee recommendations are carried out improved frequency response is possible not only as regards the tape "originals" but also the duplicates which network members receive. Some of you will be hearing more of this venture and be asked to participate.

Chairman Menzer unlocked the door of the committee room Monday afternoon (24) and the committee was able to visit the fine broadcasting equipment displayed at the NARTB Convention. A full report of the new developments in broadcast equipment

will be prepared by committee members and made available to the NAEB merbership. The committee reconvened Monday evening and Tuesday morning. It adjourned Tuesday afternoon in time for Carl Menzer and John Brugger to catch late afternoon planes.

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We had a number of items in our Newsletter folder to include in the column this month but to us the news of new developments at the NARTB Convention in Washington rates priority. Perhaps the most unique of these is the DuMont flying spot technique for live television pick-up called VITASCAN. In this system a flying spot, or beam of light from a cathode ray tube "scans" the scene or object to be televised. The light reflected from the object or persons in the scene is picked up by multiplier photo tubes. The tubes convert the light into a black and white or color television signal that may be broadcast from a television transmitter.

In the DuMont display, two light sources or scanners were used: one fixed, taken from a regular DuMont film scanner and passed thru a port in a wall and focused on the set; one portable and mounted like a camera with a lens turret containing four lenses for varying the angle of the shot. The multiplier photo-tubes are placed in "scoops" similar to those used for conventional TV lighting. Four tubes are used in each scoop, two with red selective filters, one with a blue selective filter and one with a green selective filter. The filters permit only the light of a desired color to pass into the cell. Four, six or eight of these "scoops" may be used to pick up a scene. They are placed in the same relative positions as lights in a conventional system and produce the same effect as lights when they are turned on and off.

The picture seen by these photo tubes may be transmitted either in black and white or in color. Since this Vitascan system operates by picking up reflected light, the light source must be very rigidly controlled and no ambient or stray light permitted to reach the scene. Thus, talent on the program is working practically in the dark since the light from the flying spot scanner is not sufficient to light the studio. By using stroboscopic lights so synchronized that they light only during verticle blanking time, the persons being televised "see" a lighted studio while the scanning "light" sees a dark room.

Obviously this system cannot be used for outdoor pickups. Neither could it be used for large productions. However for most local inserts in net programs, for news, for talks, for commercials, or small studio operation, seems to me it is a very practical thing.

According to DuMont's price sheet, stations already equipped with a Monochrome Multiscanner can be equipped for live monochrome for $9,207. For stations with a color Multiscanner, equipment for live color costs $15,692.

For stations with no present Multiscanner equipment, live monochrome equipment will cost $18,415 and color monochrome equipment may be secured for $32,570. If you want more information on this latest development, write DuMont for their brochure on the Vitascan Color Studio Scanner or see p. 122 of the May 23 Broadcasting-Telecasting Magazine or p. 10 of the May 21 Television Digest.

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Another development shown for the first time at the NARTB Exhibits was the RCA color effects equipment. By the use of a standard black and white vidicon camera, a colorplexer and other accessory equipment it is possible to originate color commercials, program titles, and station identification color effects from black and white slides and art work. The black and white video signal is fed into the colorplexer and by the use of a simple output switching system many varied color effects may be produced. The effects produced were in two colors such as red on blue, green on red or many other two color combinations as selected by the operator. Such a system could be used for color station identification breaks or commercials adjacent to color programs without a full complement of color equipment. The equipment used for producing these color effects would be required at a later date for color film reproduction or for live color originations.

In addition, RCA was displaying a new type live color TV camera chain, as well as a new Universal Multiplexer for color TV broadcasting which permits multiplexing both single-V monochrome and 3-V color film camera chains so that the same projectors can be used for both color and monochrome film projection.

Many manufacturers displayed color equipment. General Electric had its field sequential system in operation which in conjunction with its chromacoder produced NTSC color signals. GPL was displaying a new 3-Vidicon color film camera. Dage displayed a 3-Vidicon live industrial color camera about one-half the size of a black and white image orthicon camera. They were also showing a convertible monochrome to color vidicon film camera. By the use of one vidicon, monochrome film could be reproduced. By the addition of two more vidicons and necessary accessory equipment the same film camera could be converted to color. Dage also had on display its complete low power TV package, illustrating the possibility of equipping a TV station for less than $52,000. GPL had in operation monochrome live cameras - one of them remotely controlled as well as a 3-V color chain for film and slide. Philco exhibited two complete operating 16 mm and 35 mm film systems, as well as a newly developed crossbar switching system for local and remote video switching and a new dual light source for its color scanner.

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While much color equipment was in evidence such equipment items as new "ampliphase" 50 kw AM transmitter was on display by RCA to be available later this year. Sarkes Tarzian was showing a new line of vidicon monochrome equipment and new film projector and slide projection equipment. Kay Labs were also showing vidicon monochrome equipment with one camera equipped with a Zoomar lens. General Communications had a complete line of studio video and audio control equipment. Adler Labs displayed their low power TV transmitting equipment as well as satellite and booster equipment. Raytheon had a new high power color television relay system on display as well as a microwave audio channel. The latter makes it possible to transmit high fidelity audio over existing video relay links. They were also showing microwave relay equipment designed especially for the transmission of field sequential CBS color from mobile or fixed locations.

There were displays of lighting equipment as well as color test equipment. Gates and RCA were both showing new 3-speed broadcast quality turntables. Gates was featuring its new Hi-Watter line of AM broadcast transmitters as well as audio control equipment. Obviously it is impossible to mention all those who were displaying equipment at the 1955 NARTB Convention. We have mentioned but a few to give an idea of its

scope. We wish it were possible for every engineer in educational broadcasting to attend this exhibit of broadcasting equipment. We would also wish that they might hear the papers presented at the Broadcast Engineering Conference held in connection with this convention. Perhaps in the next year some arrangement can be made so that those who have the time, the desire, and the means can attend.

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Also of interest in educational circles were two demonstrations being held continuously last week in Washington: FM Multiplexing and Phonevision.

The Multiplex Services Corporation, in cooperation with WGMS (FM) of Washington were demonstrating their FM Multiplex equipment manufactured by Gates Radio Company. By "multiplexing" we mean the transmission simultaneously without interference of more than one program on a single FM channel. One program is transmitted on the regular FM channel which may be picked up on the ordinary FM receiver. One or more programs may be "multiplexed" over this regular program by the use of special equipment. These multiplexed programs are sent out on a super audible subcarrier in addition to the public broadcasts. If only one program is multiplexed, the full 50-15,000 cycle FM frequency range may be transmitted; however if more than one program is multiplexed, the audio frequency range of each multiplex channel is limited to 50 to 85000 cycles.

Obviously special receiving equipment must be employed to receive programs transmitted on the subcarrier (s). The FCC has recently amended its rules to permit FM broadcast stations to use multiplex methods for the transmission of income-producing subsidiary services such as storecasting, transitcasting, and functional music. It would be possible for educational stations to employ multiplexing in an FM network operation. The network program could either be transmitted to the next relay station on the main channel if it were to be carried locally or if a local program were scheduled at this time the net program could be transmitted on the multiplex channel.

Schaefer Custom Engineering also had FM equipment on display; however time did not permit us to see their equipment.

The Zenith demonstration of Phonevision also was of considerable interest. Some educators feel that some such system of scrambled television pictures may be an answer to the problem of securing tuition for college or other courses televised for credit.

In Phonevision, both audio and video are scrambled. The audio portion unscrambled, sounds a bit like inverted speech; the picture version is scrambled by changing picture polarity (i.e. blacks are white and vice versa) as well as horizontal displacement of groups of lines. Each subscriber's TV set is equipped with a decoder which must be set properly for each program it is wished to receive. In the demonstration system used, programs were numbered and on a punch board. By punching the proper program number on the board, the code number (five digits) is uncoverd to which the receiver decoder must be set to receive the program. Each set must have an individual combination set up, otherwise the code number for a particular program could be passed around for friends and neighbors to use. The system might also be set up so that the subscriber could purchase decoding information at coin machines, utilize a coin box mechanism on the set or call a Phonevision operator for decoding information.

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One other development at the NARTB Convention will no doubt produce a great deal of comment. It is the proposal by FCC Commissioner Robert E. Lee for a reallocation of the spectrum between 50 and 890 megacycles. Commissioner Lee read his proposal at the Thursday (May 26) morning session of the Broadcast Engineering Conference held in conjunction with the NARTB convention. He wished it made clear that this is not an official FCC proposal but is his own thinking on the matter.

This reallocation would provide 47 television channels, six megacycles wide between 60 and 342 megacycles. It would delete only Channel 2 of the present VHF bands and include all of the present high band VHF channels (7-13). It would move the present FM band (88-108 mc) to the top of the TV channels giving FM 342 to 362 mc. It would also mean moving military, aeronautical mobile and navigation, amateur, land-mobile, and government non-military channels. Commissioner Lee stated that this was a long range project that might take as long as 15 years to complete. Most of the comments we heard were favorable. The reallocation would bring all TV into the VHF band. Due to ease of design of TV tuners, it might decrease the cost of all-band TV sets considerably. By proper choice of channels, some space might be found immediately although the complete change would take time. This plan if accomplished might well take care of television needs for the next 100 years as well as providing better transmission for the mobile services by moving them to the 54 to 60 mc band. Spectrum space of the entire UHF TV band would become available for reassignment.

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ICONOSCOPE FILM CAMERA MODIFICATION*

Many stations using iconoscope film cameras and slide changers which douse the lamp when slides are changed may have experienced the same sort of trouble that we have here at KQED. During periods of slide change, an audibile 60 cycle hum was noticed in many receivers. After considerable experimenting it was finally found that same was caused by the extreme change in level of black and white content and the sudden change from a slide with large white content to total black during slide change.

This condition was finally licked and brought about two favorable conditions: first it entirely eliminated the 60 cycle hum during slide change, and second was much more enjoyable to watch on the receiver as there were no great changes in contrast and no retrace lines visible during slide changes as so often is the case.

The above condition was eliminated in the following manner. A piece of zip cord was connected from the slide changer rotating motor to two a.c. sockets mounted on the base inside the film camera as close to the front as possible, and two 40 watt lamps installed in same. As the slide projector lamp is doused and the rotating motor starts, the zip cord leads which are in parallel with the rotating motor leads, will light the two 40 watt lamps and thereby keep a fairly even light on the mosaic of the Iconoscope tube. Lamps of different wattage may be tried but in our particular case the 40 watt type proved most satisfactory.

*Contributed by Larry M. Reed, Chief Engineer KQED, San Francisco, California.

TV TECHNICAL TIPS NO. 10

July, 1955

By Cecil S. Bidlack, NAEB TV Engineer

The NAEB Engineering Committee, as this is written, is considering applications for the 1955 NAEB TV Engineering Workshop. However,its decision on the participants will not be made in time for us to include the names of successful applicants in this issue of the Newsletter. Individuals will be notified as soon as a decision is reached, and the entire list of successful applicants will be published next month. The Workshop will be held at WKAR-TV at East Lansing, Michigan.

Briefly, the program of this year's Workshop has been set up to cover various phases of TV engineering on the five days of the week of September 12-16. The Monday morning session will cover lighting, with talks on lighting fundamentals and measurement, TV lighting equipment, and TV lighting. Monday afternoon topics are intercommunication systems, switching systems, production-engineering relationships and personnel problems. Monday evening will be given over to a round table discussion of the day's program.

Tuesday and Wednesday have been set aside for kinescope recording. Tuesday morning topics are: general considerations for making kinescope recordings, kinescope recording systems, and a demonstration of operating practices on the WKAR-TV kine recorder. Tuesday afternoon talks cover film cameras, magnetic sound recording, optical sound recording and kinescope quality control. The Tuesday evening session will cover kinescope faults and shortcomings with film clips from the ETRC at Ann Arbor. Wednesday morning the WKAR-TV crew will demonstrate lighting, rehearsal and the actual kinescope filming of several types of TV program material.. Wednesday afternoon topics cover photographic aspects of kinescope recording, film processing and electronic gray scale for quality control. A trip to the local film processing plant is also scheduled. A round table session covering the day's activities is scheduled for Wednesday evening.

Thursday's general theme is transmitters, with the morning session devoted to proof of performance measurements. Thursday afternoon will feature a round table on transmitter operation, adjustment, and maintenance as well as a discussion of considerations of microwave installations and a description of systems in actual use. Thursday evening, Workshop participants will get together at a dinner meeting at the Kellogg Center.

Friday morning's session covers film pick-up devices and includes vidicon cameras and flying spot scanners. The new Du Mont Vitascan system will be discussed as well as a low power TV package. The morning session ends with a talk on TV test equipment. At the afternoon session the kinescope recording made Wednesday morning will be shown and discussed.

Workshop participants will be expected to arrive Sunday afternoon or evening for room assignments at Butterfield Dormitory, a new men's dormitory a short walk from the WKAR-TV studios. An informal coffee hour will be held Sunday evening at Kellogg Center which is just across the street from Butterfield Dormitory. This will enable participants to register for the Workshop and offer the opportunity to get acquainted before the opening Workshop session on Monday morning.

There you have a brief rundown of what has tentatively been lined up for the 1955 NAEB TV Engineering Workshop.

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Educational television stations will soon have three microwave installations in operation linking together multiple studio operations. The first of these is at WUNC-TV at the University of North Carolina and has been in operation since last December. The other two microwave systems are those of the Alabama Educational TV Commission now in partial operation and the one at the Detroit Educational Television Foundation.

At WUNC-TV, all switching between studios is done at the transmitter, located some eight miles from Chapel Hill, N. C. This is also the location of the film chain and kinescope recorder. Studios are located at Chapel Hill, Raleigh and Greensboro. The Greensboro circuit has a repeater station while the circuits to Chapel Hill and Raleigh are single hop transmissions.

With this type of operation, picture roll over becomes a problem due to the switching of composite signals at the transmitter. Mr. Charles A. Idol, Engineer in Charge of the Raleigh studio, is making a study of the problem as a masters thesis. We hope soon to be able to report on his solution to this problem.

In Alabama, to the best of our knowledge, only the circuit between Birmingham and Mt. Cheaha (Munford) is in service. This is a two hop circuit as are the circuits between Tuscaloosa and Birmingham and between Mt. Cheaha and the Auburn studio. An additional circuit with a relay point will be required between Auburn and Andalusia when the transmitter at Andalusia goes on the air.

In Detroit, the transmitter is located adjacent to the Detroit Public Schools studio and the system film chain. This location is connected with studios at Wayne University and the University of Detroit by microwave links.

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The June 1955 issue of Tele-Tech has as a supplement a complete electromagnetic spectrum chart which shows all 1955 FCC Frequency Allocations.

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General Electric Co. publishes a handy capacitor and color code chart which should be useful over your work bench. Write Mrs. G. Bamerick, Advertising Distribution & Supplies, Broadcast Equipment, GE, Electronics Park, Syracuse, N. Y. if you wish a copy.

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Berten Holmberg, Chief Engineer of KUOM has forwarded us copies of an article on motion picture film winds, a paper classifying film stocks titled "A" WIND OR "B" WIND -- Which is it? We'll include it in the next issue of the Engineering Newsletter, but if you wish a copy now, write to us at NAEB Headquarters.

Bert has a couple of other papers "in the mill" which we feel you'll want to read. We hope more of you will feel the urge to write up your experiences. They may be of valuable help to some fellow engineer struggling with the same problem which you have solved. Why don't you send them to us to include in the Engineering Newsletter?

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John Brugger, Chief Engineer of WILL-AM-FM-TV and Clarence Bierbaum, John Wahlfeldt and Don Colaw of his TV staff are working like the proverbial beavers to get the WILL-TV transmitter on the air. The antenna and transmission line are installed, and at this writing it is a matter of tracking down a few elusive bugs and making final adjustments before the WILL-TV test pattern will be on the air. John reports progress is being made.

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Progress too is being made in the installation of the Detroit ETV Foundation transmitter WTVS at the Detroit Public Schools Studio. With power available at the end of this week, they will be able to complete final tests before putting a test pattern on the air.

The Detroit University studio is in operation, the Public Schools studio is ready for live camera installation with film camera and projectors nearly ready for test. The Wayne University studio is still under construction with a completion date of September 1.

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POSTING OF STATION AND OPERATOR LICENSES

Cy Braum of JCET writes "I think that the NAEB engineers would be interested in knowing that on July 22 the FCC changed its rules concerning Sections 3.164, 3.264, and 3.564 which relate to the posting of station and operator licenses at AM, commercial FM, and noncommercial educational FM, respectively. These rule changes are effective August 31.

"The present rules require the licenses to be posted in the transmitter control room which raises questions about posting licenses when transmitters are operated by remote control for a part of the time. The revised rule provides for posting of the station licenses or authorizations at the principal control point of the transmitter with photocopies at other control points. Either the operator's license or FCC Form 759 must be posted at points where the operators are on duty. The language of 3.164 is as follows and the identical language is used in the other two rules:

"Station and operator licenses; posting of.

(a) The station license and any other instrument of station authorization shall be posted in a conspicuous place and in such manner that all terms are visible, at the place the licensee considers to be the principal control point of the transmitter. At all other control points listed on the station authorization, a photocopy of the station authorization shall be posted.

(b) The original operator license, or FCC Form 759, of each station operator shall be posted at the place where he is on duty as an operator."

TV Technical Tips No. 11

August, 1955

By Cecil S. Bidlack, NAEB TV Engineer

Elsewhere in this issue of the Newsletter will be found a list of the recipients of the TV Engineering Workshop grants. In the July Newsletter we included a brief resume of the program of the Workshop. We have little to add to this resume except to say that at this date most of the program details of the Workshop have been settled and confirmed. To us the program seems timely, informative and very worthwhile.

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Along with the resurgence of radio, the NAEB Network is moving ahead technically. Here at Network Headquarters we are involved in the process of changing our duplicators over from half-track to full-track recording heads. This should be good news to some of our Network stations who have encountered difficulties in playback. At the present time, eight of our twenty-two duplicating channels have been converted to full width heads. The remainder of the channels will be converted as soon as these heads are received from our supplier. So if you notice some change in recording level from tape to tape, it is due to the fact that one tape may be from a half width channel, the next may be from a full width channel with considerably higher output.

As this is being written, Champaign-Urbana is in the second week of a period of high humidity. Since our quarters are not air conditioned, these are trying days in the "back room." These are the days when we wish we could put everything on new tape, some of those returned to us being very sticky. The sticky ones drag on the tape guides and sometimes break; music wows, and much time is lost. We have hopes of getting some relief either through air conditioning or de-humidifying. Whatever is done will probably be too late for this season.

Through it all, Glenn Blackburn, our Network Production Supervisor, checks and re-checks our output, endeavoring to maintain a quality standard for the Network.

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The NAEB Engineering Committee too, is embarking on a quality control program for the NAEB Network. Soon those of you furnishing programs for the Network will be asked to submit a test tape which Ed Kratt of WNYE has volunteered to test. From the information which you record, he will be able to check head alignment, frequency response, harmonic distortion, noise and tape speed. Network Headquarters has ordered a low distortion audio oscillator and a noise and distortion

METER SO THAT THE DUPLICATING EQUIPMENT CAN BE MAINTAINED IN FIRST CLASS SHAPE WITH A MINIMUM OF EFFORT.

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LOOKS LIKE WILL-TV, HERE AT THE UNIVERSITY OF ILLINOIS, HAS BECOME No. 14 OF THE NON-COMMERCIAL EDUCATIONAL TELEVISION STATIONS ON THE AIR. THE WILL-TV TEST PATTERN HAS BEEN ON A FEW TIMES AND JOHN BRUGGER, WILL-TV CHIEF ENGINEER, AND HIS STAFF ARE HOT ON THE TRAIL OF A NON-ARCING CONDENSER THAT WILL ENABLE THEM TO FIRE UP THE TRANSMITTER ON FULL POWER. BY THE TIME YOU RECEIVE THIS, THE 12 BAY GE ANTENNA ON THE TOWER OF ILLINOIS MEMORIAL STADIUM SHOULD BE RADIATING PROGRAMS ON CHANNEL 12. THIS WILL PROVIDE TV SET OWNERS IN THE CHAMPAIGN-URBANA AREA WITH A CHANCE TO HEAR A SECOND LOCAL STATION. UP TO NOW MANY HAD NO CHOICE OF PROGRAMS EXCEPT THOSE ON THE LOCAL COMMERCIAL STATION WCIA ON CHANNEL 3.

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INCLUDED WITH THIS ISSUE OF THE NEWSLETTER IS A COPY OF THE REPORT OF THE NAEB ENGINEERING COMMITTEE ON NEW AM AND TV EQUIPMENT SHOWN AT THE 1955 NARTB CONVENTION AND EXHIBITION. IT WILL GO TO ALL MEMBERS AS WELL AS TO THOSE LISTED IN THE TECHNICAL DIRECTORY. ADDITIONAL COPIES MAY BE SECURED UPON REQUEST.

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ON JUNE 22, THE FEDERAL COMMUNICATIONS COMMISSION ADOPTED A PROPOSAL TO PERMIT TELEVISION STATIONS TO BE BUILT USING AS LITTLE AS 100 WATTS EFFECTIVE RADIATED POWER. ORIGINALLY THE FCC PROPOSED LIMITING THE 100 WATT STATIONS TO CITIES OF 50,000 OR LESS; HOWEVER, IT FINALLY DECIDED THAT THERE SHOULD BE NO POPULATION MAXIMUM OR MINIMUM ANTENNA HEIGHT RESTRICTION AS LONG AS THESE LOW POWER STATIONS PROVIDE NECESSARY SIGNAL STRENGTH OVER THE CITY SERVED. THE NEW ORDER IS EFFECTIVE AUGUST 1, AND APPLIES TO BOTH EDUCATIONAL AND COMMERCIAL STATIONS.

A NUMBER OF MANUFACTURERS HAVE DEVELOPED EQUIPMENT IN ANTICIPATION OF THIS ACTION. WHERE LIVE VIDICON CAMERAS ARE USED IT IS POSSIBLE TO OBTAIN COMPLETE STATION EQUIPMENT FOR ~$50,000. THIS MAY ASSIST IN THE DEVELOPMENT AND GROWTH OF EDUCATIONAL TELEVISION SINCE EDUCATIONAL INSTITUTIONS HAVING CLOSED CIRCUIT EQUIPMENT CAN OFTEN GET ON THE AIR FOR CONSIDERABLY LESS THAN ~$50,000.

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THE STANDARD ELECTRONICS CORPORATION OF NEWARK, N. J. HAS DEVELOPED A NEW RADIO STUDIO CONTROL SWITCHING UNIT KNOWN AS "STUDICON" WHICH ENABLES STUDIO OPERATORS TO SELECT PARTICULAR CHANNELS FOR TRANSMISSION OF THE STUDIO OUTPUT. THE "STUDICON" ELIMINATES THE NECESSITY

FOR A MASTER CONTROL WHILE RETAINING THE ADVANTAGES OF A MASTER CONTROL SYSTEM. THE FIRST INSTALLATION IS BEING MADE AT WOR-AM-FM AND WILL EFFECT A SAVINGS OF $60,000 A YEAR IN OPERATING EXPENSES FOR THE STATION.

AUDIO CONNECTIONS ARE MADE TO THE "STUDICON" SIMPLY WITH PATCH CORDS SO THAT INSTALLATION CAN BE MADE WITHOUT INTERRUPTION OF PROGRAMMING. THE WOR FACILITIES INCLUDE TWELVE STUDIOS FEEDING FOUR CHANNELS. A CONTROL BOX LOCATED IN EACH OF THE STUDIOS PERMITS THE OPERATOR TO SELECT ANY OR ALL OF THE FOUR CHANNELS AND FEED THE STUDIO OUTPUT TO THE APPROPRIATE CHANNEL. TALLY LIGHTS INDICATE "CHANNEL IN USE" AND "STUDIO ON." AN EMERGENCY LINE AMPLIFIER MAY BE SWITCHED IN IN EVENT OF A FAILURE OF THE OPERATING LINE AMPLIFIER, WITH A TALLY LIGHT INDICATING THIS CONDITION. THE CONTROLS ARE DUPLICATED FOR EACH CHANNEL WITH AN ELECTRICAL INTERLOCK SYSTEM PERMITTING ONLY ONE STUDIO TO FEED A PARTICULAR CHANNEL AT A TIME. HOWEVER, BY USE OF A "BYPASS" POSITION IT IS POSSIBLE TO INTERRUPT A PROGRAM ORIGINATING AT ANOTHER POINT, AND WHEN THE BYPASS IS RELEASED, THE ORIGINAL OPERATING CONDITION IS RESTORED.

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A NOTE FROM HERB EVANS OF WTHS-TV SAYS THAT THEY EXPECT TO HAVE TEST PATTERN ON THE AIR AUGUST 15 ON CHANNEL 2 IN MIAMI, FLORIDA.

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THE 22ND RCA TV TECHNICAL TRAINING PROGRAM WILL BE HELD IN CAMDEN, N. J. DURING THE WEEK OF SEPT. 26. THIS FIVE-DAY SERIES OF TECHNICAL LECTURES AND DEMONSTRATIONS WILL COVER BOTH MONOCHROME AND COLOR TV SYSTEMS. RESERVATIONS MAY BE MADE THROUGH YOUR RCA BROADCAST FIELD REPRESENTATIVE.

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MR. CLEMENT E. LA FOND HAS BEEN HIRED AS CHIEF ENGINEER FOR THE MEMPHIS COMMUNITY TELEVISION FOUNDATION. MR. LA FOND WAS FORMERLY CHIEF OF ENGINEERING INSTRUCTION, RADIO-TELEVISION DEPARTMENT OF THE UNIVERSITY OF HOUSTON, HOUSTON, TEXAS. HIS EXPERIENCE INCLUDES TWO YEARS AS ENGINEER AT KUHT AND FIVE YEARS AT KUHF-FM WHERE HE ASSISTED IN THE INSTALLATION OF BOTH STATIONS. HE RECEIVED A BACHELOR OF FINE ARTS DEGREE IN 1951 AND A MASTER OF ARTS DEGREE IN 1953 IN RADIO AND TELEVISION AT THE UNIVERSITY OF HOUSTON. FOR HIS MASTER'S THESIS, HE TREATED THE VARIOUS PROBLEMS OF TELEVISION STATION DESIGN UNDER THE TITLE, "AN INQUIRY INTO THE BASIC REQUIREMENTS FOR TELEVISION STATION PLANNING."

1955 TV ENGINEERING WORKSHOP WINNERS ANNOUNCED

The names of the 25 recipients of the TV Engineering Workshop Grants, awarded by the National Association of Educational Broadcasters have been announced by Dr. Harry J. Skornia, NAEB Executive Director.

The grants, providing for travel and living expenses, are to enable engineers with primary responsibilities in educational television to receive additional professional training and intensive supervised experience. The Workshop, to be held at East Lansing, Michigan, September 12-16, was made possible by a grant from the Fund for Adult Education.

Workshop grant recipients were selected by the NAEB Engineering Committee.

Names of the 25 winners are:

1. Andresen, Emil H. - Chief Engineer, Radio Station WBEZ, Board of Education, 228 North LaSalle Street, Chicago 1, Illinois.

2. Arnold, Edward J. - Technical Consultant, Channel 24, Baltimore Community Educational TV, Inc., 1121 Ramblewood Road, Baltimore 12, Maryland.

3. Baird, Robert E. - Chief Engineer, Radio Station KWSC, State College of Washington, Pullman, Washington.

4. Benson, William Gordon - Transmitter Supervisor, Radio Station KUOM, University of Minnesota, Minneapolis, Minnesota.

5. Berbaum, Clarence - Assistant Chief Engineer, University of Illinois, Television-Motion Picture Unit, 320 Peabody Drive, Champaign, Illinois.

6. Boggioni, A. J. - Radio Engineer, Radio Station WOSU, The Ohio State University, Columbus 10, Ohio.

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10. Gorsuch, Harold D. - Chief Radio Operator, Radio Station WOSU, The Ohio State University, Columbus 10, Ohio.

11. Higgy, R. C. - Director, Radio Station WOSU, The Ohio State University, Columbus 10, Ohio.

12. Johnson, James R. - Supervisor of Engineering Tests, Television Station WOI-TV, Iowa State College, Ames, Iowa.

13. Kaspar, Vernon J. - Engineer-in-charge, WOI-TV Studios, Television Station WOI-TV, Iowa State College, Ames, Iowa.

14. Kossuth, Keith - Chief Television Engineer, Wayne University, 4841 Cass Avenue, Detroit 1, Michigan.

15. Larson, Lawrence A. - Studio Supervisor, KUOM-AM and Television Kinescope Project, University of Minnesota, Minneapolis, Minnesota.

16. Louis, Wolcott B. - Assistant Supervisor in charge of Technical Operation, Station WBOE, Cleveland Board of Education, Cleveland, Ohio.

17. McClamrock, John - Chief Engineer, Radio Station KTOY, Tacoma Public Schools, 1101 South Yakima Avenue, Tacoma 3, Washington.

18. Menzer, Carl H. - Director, Radio Stations WSUI-KSUI, State University of Iowa, Iowa City, Iowa.

19. Phillips, C. D. - Chief Engineer, TV Laboratory, State University of Iowa, Iowa City, Iowa.

20. Rawson, Merlyn D. - Chief Engineer, Radio Station KUSC-FM, University of Southern California, 3518 University Avenue, Los Angeles, California.

21. Reed, Lawrence - Chief Engineer, Station KQED-TV, Bay Area ETV Association, 165 Post Street, San Francisco, California.

22. Richardson, Arthur W. - Chief Engineer, Station WGBH-TV, Lowell Institute Cooperative Broadcasting Council, Cambridge 39, Massachusetts.

23. Stiehl, John H. - Chief Engineer, Stations WHA-AM-FM-TV, University of Wisconsin, Madison, Wisconsin.

24. Townsley, Ralph R. - Chief Engineer, Radio Station WBAA, Purdue University, Lafayette, Indiana.

25. Uhrig, Arley F. - Chief Engineer, Television Station WHA-TV, University of Wisconsin, Madison, Wisconsin.

Proposed WUNC-TV "Uni-Sync" System

In the Technical Tips column of the July NAEB Newsletter we mentioned three microwave installations linking together multiple studio operations feeding an educational TV transmitter. Unless each studio has a film chain, the integration of slides and film into a program is a problem due to picture rollover. Each installation presents an individual problem due to location of the film chain with respect to the transmitter.

Charles A. Idol, Engineer-in-Charge of the WUNC-TV Raleigh studio is working on this sync lock problem. WUNC-TV has three studios, at Raleigh, Chapel Hill and Greensboro. The film chain is located at the transmitter site which is about eight miles from Chapel Hill. Here, in brief, is the plan Mr. Idol is working on to enable WUNC-TV to switch or lap and super slides at the transmitter over the video from any of their three studios without difficulty.

At each studio sync from the transmitter is received with a Conrac tuner, processed with the stabilizing amplifier, then fed into the special equipment. In this equipment, the horizontal components are separated by differentiation and fed into a multivibrator, whose period is sufficiently long so the equalizing pulses do not initiate a cycle of operation. The purpose of this unit is to produce output pulses at 15.750 kc only, with no 31.5 kc pulses at all. Each of these output pulses is fed into a phantastron circuit, provided with an adjustable time constant from about 5 microseconds to about 40 microseconds. The trailing edge of the resulting rectangular pulse is used, after differentiation and clipping, to operate the horizontal section of the RCA Genlock on the sync generator. Adjustment of the phantastron delay results in the pictures being locked horizontally, with the sync being transmitted from the transmitter, as they arrive at the transmitter.

The horizontal section, described above, performs very well. Without the vertical section, however, the device is pretty well worthless. To provide the required vertical delay, about 16,300 microseconds, more complicated means are required.

It was decided that, even with its unusual stability, the phantastron circuit would not delay 16,000 microseconds with the required stability. Hence, recourse was taken to counters, where, it is expected, more exact methods obtain.

Briefly, the horizontal pulses, after elimination of the equalizing pulses described above, are fed into a system of binary counters. Since the vertical sync pulse occurs coincident with a horizontal pulse during one field and 31.75 microseconds behind a horizontal pulse during the next field, mere counting of the 15.75 kc pulses will not result in a constant delay from field to field. Hence, we have resorted to producing of 31.5 kc pulses from the 15.75 kc pulses, and these are the pulses that are counted. After a prescribed number, 520, have been counted, a gate is opened, through which comes an equalizing pulse from the delayed horizontal pulses (output of the above-mentioned horizontal section). This set of 31.5 kc pulses, too, is generated from the 15.75 kc output pulses. The pulse that comes through the gate triggers a univibrator, which generates a synthetic vertical sync pulse (no serrations). This synthetic vertical sync pulse is fed into the RCA Genlock vertical phasing section. Assuming the counter circuits open the gate at the proper time, the total delay produced is very nearly determined by the horizontal section, namely the phantastron circuits. The counters are reset by a vertical sync pulse, separated from the sync input by integration.

Figure 1 is a block diagram of the present proposed system. Although the system is not yet completed, Mr. Idol believes it should perform satisfactorily. Drifting of circuits will result in a very slight picture displacement which will not be too objectionable. A check on the adjustment may be made by transmitting a test pattern from a studio and observing the picture received off the air. Adjustments may be made while actually on the air with little inconvenience or effect on the received picture.

Admittedly this system is a fairly complicated one. However, even as development progresses, simplifications present themselves, and, as they do, they are introduced.

Mr. Idol hopes that readers of the Engineering Newsletter may have suggestions regarding this problem. He believes that once the Detroit studios begin operation and when multiple studio operation in Alabama becomes an accomplished fact, this problem will become very real to these localities too. He feels that by pooling ideas we may be able to find a solution more readily.

Editor's Note: Due to the size of the block diagram of Figure 1, we were forced to use two pages for this diagram. However these are mimeographed so that you can remove p. 17, join it to page 16 to produce the complete block diagram.

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NAEB Placement Service

We'd like to call attention of technical personnel to the fact that NAEB is operating a Placement Service here at NAEB Headquarters in Urbana. From time to time we have inquiries from AM and TV stations who have positions open for technical personnel. Unfortunately there are few, if any, names of technically trained people in the Placement Service files who are seeking other positions.

We are not trying to entice you from your present position. If you are unhappy where you are, or are seeking to better your position, perhaps you should be registered with the NAEB Placement Service so that you may hear about these position openings. There is no charge for this service. Your registration will be kept confidential and your present employer will not be contacted unless or until you give us permission.

For further information on the NAEB Placement Service, address your inquiry to

Robert E. Underwood, Jr.
NAEB Placement Service
14 Gregory Hall
Urbana, Illinois

NOTES:

1- Several blocks above may be performed by a single tube, such as "clip. amp." Other single blocks may require several tubes, such as "520-1 counter," "horizon.phantas."

2- Additional refinements, such as diode trigger inserters, isolation amplifiers cathode followers, etc., omitted from diagram for simplicity.

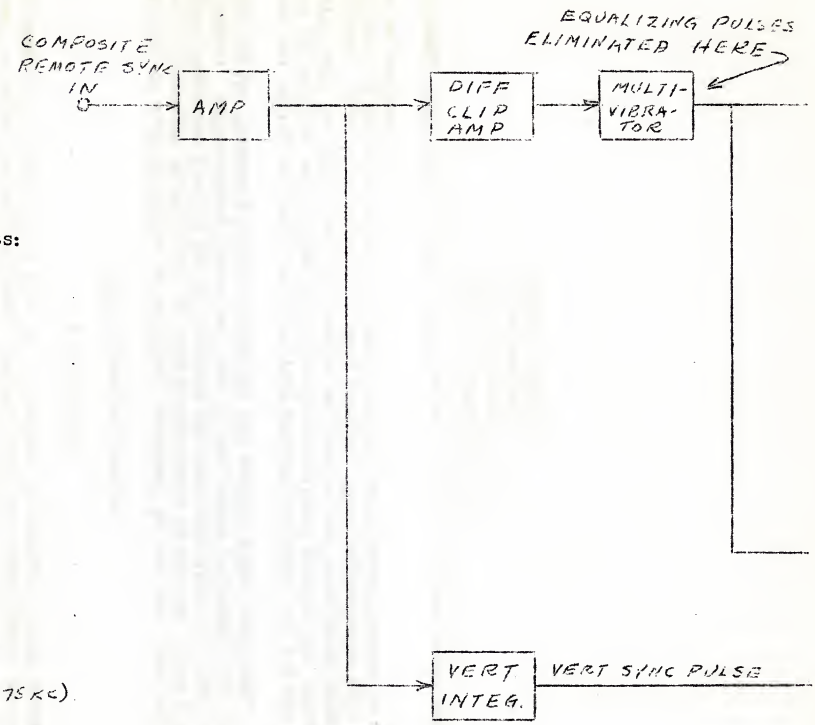
3- Stability dependent upon following circuits:

horizon. delay ~ horizon. phantastron

vert. delay ~ a. horizon. delay circuit
b. univibrator "A"
c. univibrator "B"
d. univibrator "C"
e. vert. integ.

4- Stability requirements may necessitate replacement of univibrators with phantastrons in some cases.

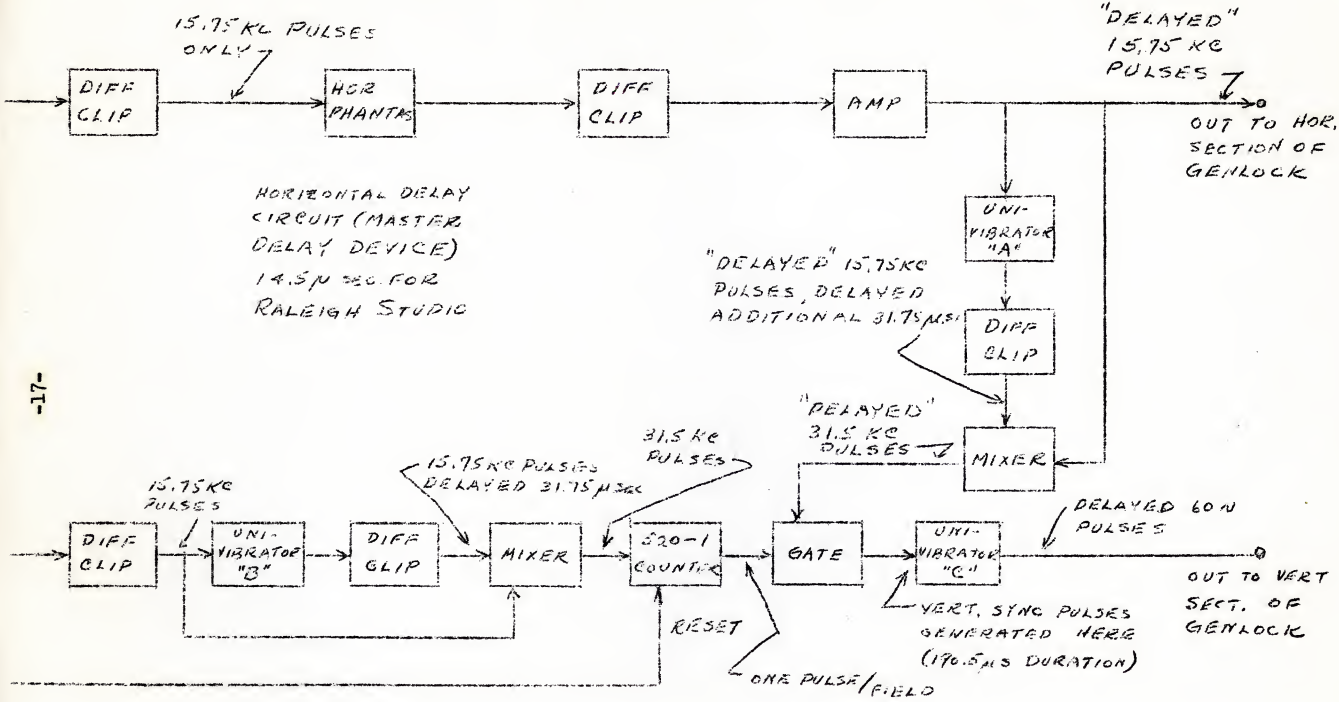
5- Values given are for Raleigh studio unit. Number of counters will differ for other studio units.



LEGEND

AMP. ~ AMPLIFIER (LINEAR)
DIFF. ~ DIFFERENTIATOR
HOR. ~ HORIZONTAL LINE RATE (15,75 KC)
INTEG ~ INTEGRATOR
PHANTAS. ~ PHANTASTRON DELAY CIRCUIT
VERT. ~ VERT FIELD RATE (60 CYCLES)

FIGURE 1 P1 OF 2



PROPOSED "UNI-SYNC" SYSTEM (BLOCK DIAGRAM)
WUNC-TV STUDIOS, U. OF N. CAROLINA TV NETWORK
C. A IDOL, RALEIGH, N.C. 5-24-55

FIGURE 1 P2 OF 2

Scanned from the National Association of Educational Broadcasters Records
at the Wisconsin Historical Society as part of
"Unlocking the Airwaves: Revitalizing an Early Public and Educational Radio Collection."

A collaboration among the Maryland Institute for Technology in the Humanities,
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